AMENDMENTS TO THE CLAIMS:

This following listing of claims will replace prior versions and listings of the claims in the application:

Listing of claims:

1. (Currently Amended) A method for making a modified epoxy, comprising the steps of:

a) mixing solvents and clay particles of a dimension in the nanometer range, to form ~~into~~ a clay solution;

b) generating a flow of ~~submitting the~~ clay solution and submitting said flow to: (1) a high pressure to generate ~~,~~ high ~~flow~~ velocity and to allow shearing in the clay solution to occur; (2) ~~flow in a micrometer-range circuit, to breaking impacts of the particles in~~ a region of obstacles allowing breaking-up of agglomerates of clay particles occurring in the clay solution; and (3) a sudden lower~~, and to a reduces~~ pressure, yielding a dispersed clay ~~particles~~ solution having a fine and homogeneous distribution of clay particles of a dimension in the nanometer range in the clay solution; and

c) mixing the dispersed clay ~~particles~~ solution with at least a pristine epoxy~~; whereby particles in the modified epoxy are finely and homogeneously distributed~~.

2. (Cancelled)

3. (Previously Presented) The method according to claim 1, wherein said step a) comprises incorporating a first part of the pristine epoxy and said step c) comprises mixing the dispersed clay particles solution with a remaining part of the pristine epoxy.

4. (Original) The method according to claim 1, wherein said step a) comprises mixing with at least one of mechanical and ultrasonic mixing.

5. (Original) The method according to claim 1, wherein said step b) comprises submitting the clay solution to a pressure of about 20,000 psi in tubes of a diameter of about 0.1 mm.

6. (Original) The method according to claim 1, wherein said step b) comprises exfoliating the clay particles in the solution.

7. (Original) The method according to claim 1, wherein said step c) comprises mixing the dispersed clay particle solution with the pristine epoxy and curing agents to yield a solid epoxy material.

8. (Original) The method according to claim 1, whereby the modified epoxy comprises agglomerates of less than about 1 μm and agglomerates of a maximum diameter comprised between about 1 μm and 2 μm.

9. (Original) The method according to claim 1, whereby the modified epoxy has enhanced viscoelastic properties, improved fracture toughness, and critical strain energy release rate compared to the pristine epoxy.

10. (Currently Amended) The method according to claim 9, whereby the modified epoxy has an increase in K_{IC} and G_{IC} of up to 2 and ~~8~~ 3 times respectively with respect to the pristine epoxy, at about 1 wt % of clay loading.

11. (Original) The method according to claim 1, whereby the modified epoxy has enhanced barrier properties, including water absorption resistance, adhesion strength and flammability resistance, with respect to the pristine epoxy.

12. (Original) The method according to claim 1, wherein a mixture of clay and epoxy obtained has a stability over an extended period of time.

13. (Original) The method according to claim 1, wherein the pristine epoxy is a rubber-modified epoxy resin.

14. (Currently Amended) An apparatus for making modified epoxy from a pristine epoxy, comprising:

a) a first container for preparing a solution of clay particles;

b) a device for dispersing the solution of clay particles; and

c) a second container for mixing the dispersed solution of clay particles with the pristine epoxy;

wherein said device for dispersing the solution of clay particles comprises : a) a first section for submitting a flow of the solution of clay particles to ~~a~~ high pressure to generate ~~and a~~ high velocity and to allow breaking impacts to break up agglomerates of clay particles occurring in the solution; and 3)~~; a second section of obstacle; and~~ a pressure-collapse chamber to provide a sudden lower pressure, yielding a dispersed clay solution ~~; an output solution from said device~~ having a fine and homogeneous distribution of clay particles of a dimension in the nanometer range in the clay solution ~~of nano-dimensions~~.

15. (Original) The apparatus according to claim 14, wherein the solution of clay particles comprises part of the pristine epoxy.

16. (Original) The apparatus according to claim 14, wherein the pristine epoxy is incorporated in the solution of clay particles in one of said first container and said second container.

17. (Cancelled)

18. (Original) The apparatus according to claim 14, wherein the pristine epoxy is a rubber-modified epoxy.

19. (Original) The apparatus according to claim 14, wherein the solution of clay particles comprises additives.

20. (Currently Amended) A modified epoxy produced from a pristine epoxy, the modified epoxy having at least higher barrier properties and thermal resistance than the pristine epoxy, the modified epoxy produced by:

a) mixing solvents and clay particles~~,~~ of a dimension in ~~a micrometer~~ the nanometer range, to form ~~into~~ a clay solution;

b) generating a flow of ~~submitting the~~ clay solution and submitted said flow to: (1) high pressure to generate high velocity and to allow shearing in the clay solution to occur ~~gradient between input and output to generate a high flow velocity, shearing flow and breaking impacts of the particles in a region of obstacles, then~~ ; and to:(3) a sudden lower pressure, yielding a dispersed clay ~~particles~~ solution having a fine and homogeneous distribution of clay particles of a dimension in the nanometer range in the clay solution; -and

c) mixing the dispersed clay ~~particles~~ solution with at least part of the pristine epoxy~~; particles of nano-dimensions in the modified epoxy being finely and homogeneously distributed~~.

21. (Original) The modified epoxy according to claim 20, comprising finely dispersed clay agglomerates of less than about 1 μm and agglomerates of a maximum diameter between about 1 μm and 2 μm.

22. (Currently Amended) The modified epoxy according to claim 20 ~~claim 21~~, wherein a content of ~~clay agglomerates at~~ about 1 wt % of clay loading yields an increase in a fracture toughness, with an increase in K_{IC} and G_{IC} of up to 2 and ~~8~~ 3 times, with respect to the pristine epoxy respectively.

23. (Original) The modified epoxy according to claim 21, wherein said pristine epoxy is a rubber-modified epoxy.

24. (Original) The modified epoxy according to claim 21, further comprising additives.

25. (Cancelled)

26. (New) The modified epoxy according to 23, wherein the modified epoxy has an increase in K_{IC} and G_{IC} of up to 2.2 and 7.6 times respectively at 6-phr organoclay loading and 20-phr CTBN compared with the pristine epoxy.

27. (New) The method according to claim 23, wherein the modified epoxy has an increase in K_{IC} and G_{IC} of up to 2.2 and 7.6 times respectively at 6-phr organoclay loading and 20-phr CTBN compared with the pristine epoxy.